

SEQUENCE LISTING

5 <110> Leiden University Medical Center

10 <120> Synthetic protein as tumor-specific vaccine

15 <130> P210601 pct

20 <160> 6

<170> PatentIn version 3.1

25

<210> 1

30

<211> 98

<212> PRT

<213> Human papillomavirus type 16

35

<400> 1

40 Met His Gly Asp Thr Pro Thr Leu His Glu Tyr Met Leu Asp Leu Gln
1 5 10 15

Pro Glu Thr Thr Asp Leu Tyr Cys Tyr Glu Gln Leu Asn Asp Ser Ser
20 25 30

45

Glu Glu Glu Asp Glu Ile Asp Gly Pro Ala Gly Gln Ala Glu Pro Asp
35 40 45

50

Arg Ala His Tyr Asn Ile Val Thr Phe Cys Cys Lys Cys Asp Ser Thr
50 55 60

55

Leu Arg Leu Cys Val Gln Ser Thr His Val Asp Ile Arg Thr Leu Glu
65 70 75 80

60

Asp Leu Leu Met Gly Thr Leu Gly Ile Val Cys Pro Ile Cys Ser Gln
85 90 95

Lys Pro

5

<210> 2

<211> 158

10

<212> PRT

<213> Human papillomavirus type 16

15

<400> 2

Met His Gln Lys Arg Thr Ala Met Phe Gln Asp Pro Gln Glu Arg Pro
 1 5 10 15

20

Arg Lys Leu Pro Gln Leu Cys Thr Glu Leu Gln Thr Thr Ile His Asp
 20 25 30

25

Ile Ile Leu Glu Cys Val Tyr Cys Lys Gln Gln Leu Leu Arg Arg Glu
 35 40 45

30

Val Tyr Asp Phe Ala Phe Arg Asp Leu Cys Ile Val Tyr Arg Asp Gly
 50 55 60

35

Asn Pro Tyr Ala Val Cys Asp Lys Cys Leu Lys Phe Tyr Ser Lys Ile
 65 70 75 80

40

Ser Glu Tyr Arg His Tyr Cys Tyr Ser Leu Tyr Gly Thr Thr Leu Glu
 85 90 95

45

Gln Gln Tyr Asn Lys Pro Leu Cys Asp Leu Leu Ile Arg Cys Ile Asn
 100 105 110

Cys Gln Lys Pro Leu Cys Pro Glu Glu Lys Gln Arg His Leu Asp Lys
 115 120 125

50

Lys Gln Arg Phe His Asn Ile Arg Gly Arg Trp Thr Gly Arg Cys Met
 130 135 140

55

Ser Cys Cys Arg Ser Ser Arg Thr Arg Arg Glu Thr Gln Leu
 145 150 155

<210> 3

60

<211> 365

<212> PRT

<213> Human papillomavirus type 16

5

<400> 3

10 Met Glu Thr Leu Cys Gln Arg Leu Asn Val Cys Gln Asp Lys Ile Leu
1 5 10 15

15 Thr His Tyr Glu Asn Asp Ser Thr Asp Leu Arg Asp His Ile Asp Tyr
20 25 30

20 Trp Lys His Met Arg Leu Glu Cys Ala Ile Tyr Tyr Lys Ala Arg Glu
35 40 45

Met Gly Phe Lys His Ile Asn His Gln Val Val Pro Thr Leu Ala Val
50 55 60

25 Ser Lys Asn Lys Ala Leu Gln Ala Ile Glu Leu Gln Leu Thr Leu Glu
65 70 75 80

30 Thr Ile Tyr Asn Ser Gln Tyr Ser Asn Glu Lys Trp Thr Leu Gln Asp
85 90 95

35 Val Ser Leu Glu Val Tyr Leu Thr Ala Pro Thr Gly Cys Ile Lys Lys
100 105 110

His Gly Tyr Thr Val Glu Val Gln Phe Asp Gly Asp Ile Cys Asn Thr
115 120 125

40 Met His Tyr Thr Asn Trp Thr His Ile Tyr Ile Cys Glu Glu Ala Ser
130 135 140

45 Val Thr Val Val Glu Gly Gln Val Asp Tyr Tyr Gly Leu Tyr Tyr Val
145 150 155 160

50 His Glu Gly Ile Arg Thr Tyr Phe Val Gln Phe Lys Asp Asp Ala Glu
165 170 175

55 Lys Tyr Ser Lys Asn Lys Val Trp Glu Val His Ala Gly Gly Gln Val
180 185 190

Ile Leu Cys Pro Thr Ser Val Phe Ser Ser Asn Glu Val Ser Ser Pro
195 200 205

60

Glu Ile Ile Arg Gln His Leu Ala Asn His Pro Ala Ala Thr His Thr

210 215 220
 5 Lys Ala Val Ala Leu Gly Thr Glu Glu Thr Gln Thr Thr Ile Gln Arg
 225 230 235 240
 10 Pro Arg Ser Glu Pro Asp Thr Gly Asn Pro Cys His Thr Thr Lys Leu
 245 250 255
 15 Leu His Arg Asp Ser Val Asp Ser Ala Pro Ile Leu Thr Ala Phe Asn
 260 265 270
 20 Val His Leu Lys Gly Asp Ala Asn Thr Leu Lys Cys Leu Arg Tyr Arg
 290 295 300
 25 Phe Lys Lys His Cys Thr Leu Tyr Thr Ala Val Ser Ser Thr Trp His
 305 310 315 320
 30 Trp Thr Gly His Asn Val Lys His Lys Ser Ala Ile Val Thr Leu Thr
 325 330 335
 35 Tyr Asp Ser Glu Trp Gln Arg Asp Gln Phe Leu Ser Gln Val Lys Ile
 340 345 350
 40 Pro Lys Thr Ile Thr Val Ser Thr Gly Phe Met Ser Ile
 355 360 365
 45 <210> 4
 <211> 105
 <212> PRT
 <213> Human papillomavirus type 18
 50 <400> 4
 Met His Gly Pro Lys Ala Thr Leu Gln Asp Ile Val Leu His Leu Glu
 1 5 10 15
 55 Pro Gln Asn Glu Ile Pro Val Asp Leu Leu Cys His Glu Gln Leu Ser
 20 25 30
 60 Asp Ser Glu Glu Glu Asn Asp Glu Ile Asp Gly Val Asn His Gln His
 35 40 45

```

Leu Pro Ala Arg Arg Ala Glu Pro Gln Arg His Thr Met Leu Cys Met
50      55      60
5
Cys Cys Lys Cys Glu Ala Arg Ile Glu Leu Val Val Glu Ser Ser Ala
65      70      75      80
10
Asp Asp Leu Arg Ala Phe Gln Gln Leu Phe Leu Asn Thr Leu Ser Phe
85      90      95
15
Val Cys Pro Trp Cys Ala Ser Gln Gln
100      105
20
<210> 5
<211> 158
<212> PRT
25
<213> Human papillomavirus type 18
30
<400> 5
Met Ala Arg Phe Glu Asp Pro Thr Arg Arg Pro Tyr Lys Leu Pro Asp
1      5      10      15
35
Leu Cys Thr Glu Leu Asn Thr Ser Leu Gln Asp Ile Glu Ile Thr Cys
20      25      30
40
Val Tyr Cys Lys Thr Val Leu Glu Leu Thr Glu Val Phe Glu Phe Ala
35      40      45
45
Phe Lys Asp Leu Phe Val Val Tyr Arg Asp Ser Ile Pro His Ala Ala
50      55      60
50
Cys His Lys Cys Ile Asp Phe Tyr Ser Arg Ile Arg Glu Leu Arg His
65      70      75      80
55
Tyr Ser Asp Ser Val Tyr Gly Asp Thr Leu Glu Lys Leu Thr Asn Thr
85      90      95
Gly Leu Tyr Asn Leu Leu Ile Arg Cys Leu Arg Cys Gln Lys Pro Leu
100      105      110
60
Asn Pro Ala Glu Lys Leu Arg His Leu Asn Glu Lys Arg Arg Phe His
115      120      125

```

Asn Ile Ala Gly His Tyr Arg Gly Gln Cys His Ser Cys Cys Asn Arg
 130 135 140

5

Ala Arg Gln Glu Arg Leu Gln Arg Arg Arg Glu Thr Gln Val
 145 150 155

10 <210> 6

<211> 365

<212> PRT

15 <213> Human papillomavirus type 18

20 <400> 6

Met Gln Thr Pro Lys Glu Thr Leu Ser Glu Arg Leu Ser Cys Val Gln
 1 5 10 15

25

Asp Lys Ile Ile Asp His Tyr Glu Asn Asp Ser Lys Asp Ile Asp Ser
 20 25 30

30

Gln Ile Gln Tyr Trp Gln Leu Ile Arg Trp Glu Asn Ala Ile Phe Phe
 35 40 45

35

Ala Ala Arg Glu His Gly Ile Gln Thr Leu Asn His Gln Val Val Pro
 50 55 60

40

Ala Tyr Asn Ile Ser Lys Ser Lys Ala His Lys Ala Ile Glu Leu Gln
 65 70 75 80

45

Met Ala Leu Gln Gly Leu Ala Gln Ser Arg Tyr Lys Thr Glu Asp Trp
 85 90 95

50

Thr Leu Gln Asp Thr Cys Glu Glu Leu Trp Asn Thr Glu Pro Thr His
 100 105 110

55

Cys Phe Lys Lys Gly Gly Gln Thr Val Gln Val Tyr Phe Asp Gly Asn
 115 120 125

60

Lys Asp Asn Cys Met Thr Tyr Val Ala Trp Asp Ser Val Tyr Tyr Met
 130 135 140

Thr Asp Ala Gly Thr Trp Asp Lys Thr Ala Thr Cys Val Ser His Arg
 145 150 155 160

	Gly	Leu	Tyr	Tyr	Val	Lys	Glu	Gly	Tyr	Asn	Thr	Phe	Tyr	Ile	Glu	Phe	
					165					170					175		
5	Lys	Ser	Glu	Cys	Glu	Lys	Tyr	Gly	Asn	Thr	Gly	Thr	Trp	Glu	Val	His	
				180					185					190			
10	Phe	Gly	Asn	Asn	Val	Ile	Asp	Cys	Asn	Asp	Ser	Met	Cys	Ser	Thr	Ser	
			195					200					205				
15	Asp	Asp	Thr	Val	Ser	Ala	Thr	Gln	Leu	Val	Lys	Gln	Leu	Gln	His	Thr	
		210					215					220					
20	Pro	Ser	Pro	Tyr	Ser	Ser	Thr	Val	Ser	Val	Gly	Thr	Ala	Lys	Thr	Tyr	
	225					230					235					240	
25	Gly	Gln	Thr	Ser	Ala	Ala	Thr	Arg	Pro	Gly	His	Cys	Gly	Leu	Ala	Glu	
					245					250					255		
30	Lys	Gln	His	Cys	Gly	Pro	Val	Asn	Pro	Leu	Leu	Gly	Ala	Ala	Thr	Pro	
				260					265					270			
35	Thr	Gly	Asn	Asn	Lys	Arg	Arg	Lys	Leu	Cys	Ser	Gly	Asn	Thr	Thr	Pro	
			275					280					285				
40	Ile	Ile	His	Leu	Lys	Gly	Asp	Arg	Asn	Ser	Leu	Lys	Cys	Leu	Arg	Tyr	
		290					295					300					
45	Arg	Leu	Arg	Lys	His	Ser	Asp	His	Tyr	Arg	Asp	Ile	Ser	Ser	Thr	Trp	
	305					310					315					320	
50	His	Trp	Thr	Gly	Ala	Gly	Asn	Glu	Lys	Thr	Gly	Ile	Leu	Thr	Val	Thr	
					325					330					335		
55	Tyr	His	Ser	Glu	Thr	Gln	Arg	Thr	Lys	Phe	Leu	Asn	Thr	Val	Ala	Ile	
				340					345					350			
60	Pro	Asp	Ser	Val	Gln	Ile	Leu	Val	Gly	Tyr	Met	Thr	Met				
			355					360					365				